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ABSTRACT

Almost 19,000 Dade County Public School students--all the members of the 8th grade cohort in June 1980--were followed across four and a half years in a study of dropouts. Major findings include the following: (1) at the end of the follow-up period, 29.5% of the cohort had dropped out (19% of Asians, 26.4% of Whites, 29.3% of Hispanics, and 33.9% of Blacks; 26.8% of females and 32.1% of males); (2) almost 60% of the dropping out took place in the first two years of the follow-up; (3) compared to Whites and Hispanics, Blacks were more likely to drop out late in the follow-up period; (4) the dropout rate for Cuban-born Hispanics was 30% versus 28.8% for all other Hispanic students (the rate for pre-Mariel Cubans was 29.9%, for post-Mariel Cubans 33%); (5) the dropout rate for Haitian-born students was 38.8%, the highest of any group; (6) the dropout rate for exceptional (but not including gifted) students was higher than the regular student rate; and (7) students who were not out of phase (i.e. had not been kept back) by 8th grade were equally likely to drop out regardless of ethnic group, and were less than half as likely to drop out as students who were out of phase by that time. (The longitudinal method of calculating dropout rate used in this study is described and contrasted with the cross-sectional method in an appendix.) (CMG)

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ED261119

A Study of the Longitudinal Dropout Rate: 1980 Eighth-Grade Cohort Followed From June, 1980 Through February, 1985

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INTRODUCTION

This study reports dropout rates for a group of 18,829 DCPS students followed across a four-and-one-half year period (June 1980 - February 1985). This group, called a "cohort," consists of all students who were eighth graders in June 1980, prior to the time promotions to the next grade were made. Membership, dropout, transfer, and other records used in this report were taken from the district's computerized student files (ISIS).

The designation "dropout" as used in this report is believed to be as accurate and exhaustive as could be developed. For example, exceptional students, students whose parents are not U.S. citizens, retained students, and students who simply disappeared between the end of one school year and the beginning of the next - the "no shows" - are included in this study.*

For current purposes, a dropout is any student who leaves the K-12 program before completing a program of studies and receiving either a certificate of completion or a diploma. Excluded from the dropout category are students who were graduated, are (as of 2/22/85) still in the K-12 programs, were transferred to another non-DCPS school, who died, were transferred to the Court or a private agency for purposes of custody, or who were expelled.

As will subsequently be seen, any rate - dropout or otherwise - is essentially a fraction composed of a numerator and a denominator (see Appendix). To interpret a rate, one must know what goes into the numerator and into the denominator. Without this information it is easy to be "mislead by statistics." Some districts, for example, do not include the summer "no shows" in the dropout numerator, even when they are counted in the denominator; other districts exclude exceptional students, or students whose parents are non-resident aliens, and so on.

The tracking for several (4 1/2) years of the 18,829, 1980 eighth graders involved a different approach than has been used in developing all other DCPS dropout rates. Apart from different ways of defining the composition of the numerators and denominators, there are two fundamentally different, accepted approaches to calculating dropout rates. These are the annual/cross-sectional and the longitudinal approaches. The differences in these two approaches are described in detail in the Appendix, the reading of which is required for understanding this report and the reasons its results differ from previously reported DCPS dropout rates. For current purposes it is sufficient to state that

1. the results of the two approaches differ in mathematically predictable ways, the longitudinal method used here always yielding higher results;
2. the two approaches address and answer different questions, and have different sets of advantages and disadvantages, and;
3. that despite these differences the two approaches are equally accurate/inaccurate because accuracy depends on the accuracy of the student records, on the specificity with which the numerator/denominator components are defined, and on the completeness with which these components are "made known" when the rate is reported.

* The only large district known to have produced a report "sort of like" this one is Los Angeles, and they have currently put their report on hold because of technical problems - principally the lack of a computerized student data base.

Before turning to the results, two notes should be made. One is that every dropout rate contains a component of error, errors produced because the student records on which the rates are based are not entirely accurate. As noted in an earlier 1983 OEA study on dropout reporting procedures, there is reason to believe that file errors could easily produce overall rates which are over or understated by five to ten percent of their actual value; that is, a true 20% rate might be reported in a range from 18 to 22 percent.

Secondly, the current study's rates for the first (and to a lesser extent the second) year of the follow-up period are probably too high. The basis for this belief is that it is very easy for a student, the summer "no show" in particular, to get his/her report card from the end of one year, "transfer" to another non-DCPS school, show the report card and register, without anyone even notifying the district of the student's attendance in a new school. For this reason, and because 1980 and 1981 were times of large immigration (Cuba, Haiti), and times of perhaps atypical levels of middle-class out-migration, the rates reported here may be overly high.

OEA:3/11/85
ML,Eval1,jm Study Dropout Rate - 8th Grade

Results Section

The 18,869 students, who were eighth graders in June of 1980, were followed for a period of four-and-one-half years through the first semester of the 1984-85 school year. Results are shown in Table 1 below where the students' status at the end of the period is displayed.

Table 1*

Cohort Status at the End of Follow-up Period:
By Ethnicity, By Gender, and for Total Cohort

	WHITE	BLACK	HISPANIC	ASIAN	MALE	FEMALE	TOTAL
No. Grad	3,382	2,361	3,180	81	4,152	4,853	9,005
% Grad.	51.6	44.1	46.8	66.9	43.0	53.0	47.8%
No. Transfer	1,245	596	1,264	12	1,669	1,449	3,118
% Transfer	19.0	11.1	18.6	9.9	17.3	15.8	16.6%
No. Still in school	199	577	354	5	737	398	1,135
% Still in school	3.0	10.8	5.2	4.1	7.6	4.3	6.0%
No. Dropping out	1,730	1,813	1,922	23	3,107	2,456	5,563
% Dropping out	26.4	33.9	29.3	19.0	32.1	26.8	29.5%

*Excepting the Total column, the status percents are for the ethnic/gender portion of the cohort, e.g., 3,382, or 51.6%, of the 6,559 white cohort had been graduated by Feb., 1985. Note also that records for eight students were uninterpretable and could not be classified into one of these categories, and that American Indians are counted in the totals but are not displayed separately because of their small numbers.

As is indicated in Table 1, slightly less than half (47.8%) of the 18,829 students had been graduated by the end of the 4.5 year period; about one in six (16.6%) had transferred out of the district; six percent were still in school, and 29.5% had dropped out.

Concerning the four ethnic groups, the graduation rates were highest for Asians (66.9%), and lowest for Blacks (44.1%), with rates for Whites and Hispanics in between (51.6% and 46.8% respectively).

Concerning transfers out of the district, almost one in five of the White and the Hispanic students transferred to a non-DCPS school; rates for Blacks and Asians were considerably lower.

Considering the number of students still enrolled in the K-12 program, the numbers are comparatively small, ranging from three percent of the White to 10.8% of the Black students. The students still in school were, of course, retained at least one time over the follow-up period.

Consider next the dropout rates for the four ethnic groups. Over the follow-up period these rates were somewhat variable, being lowest for Asian (19.0%) and highest for Black (33.9%) students, with White (26.4%) and Hispanic (29.3%) students again following in between these two extremes. Thus, the dropout and graduation rates for all ethnic groups appear to be offsetting, despite the comparatively large numbers of White and Hispanic students transferring out of the district.

Consider next the rates for males and females. Concerning graduation, somewhat less than half of the males (43.0%) and slightly more than half of the females (53.0%) had been graduated by the end of the 4.5 year period. About one of six of both groups had transferred, and less than one in ten were still enrolled in the K-12 program.

In terms of dropout rates, the rate for females was lower than that for males (26.8% vs. 32.1%). Females have higher graduation and lower dropout rates than males. Generally, about 20% more females than males graduate and about 10% more males than females dropout.

The graduation, transfer, and retention rates in Table 1 were displayed to provide background for the reader. In all following tables, only dropout information will be presented.

Consider next the annual, longitudinal rates for the entire cohort followed from June 1980 to February 1985. In reviewing those annual rates, note that they sum to the 29.5% dropout rate for the entire follow-up period. These rates are shown in Table 2 below.

Table 2*

Numbers and Percents of Dropouts
Leaving During Each Year of the Follow-up Period

	1980-81	1981-82	1982-83	1983-84	1985	TOTAL
Number	1,609	1,548	1,126	758	522	5,563
% of 5,563	28.9	27.8	20.2	13.6	9.4	100%
% of 18,829	8.5	8.2	6.0	4.0	2.8	29.5%

*In this and later tables, "1985" means "through the first semester of the 1984-85 school year."

As indicated in Table 2, and consistent with the dropout information in Table 1, about three of every ten 1980 eighth graders had, according to district records, dropped out over the 4.5 year period.

This rate may seem particularly high when compared to the historical, cross-sectional rates of about 15-18%. This perceived difference is due almost entirely to the mathematically predictable differences between the cross-sectional and longitudinal methods (see the Appendix).

In considering the annual information in Table 2, perhaps the most interesting pattern is the progressive decrease in the annual rates. Of those 5,563 students who dropped out, almost 60% (56.7%) did so in the first two years of the follow-up. After 1981-82, the successive year's rates decrease markedly. In the last year-and-a-half of the follow-up, only 1,280 (6.8%) of the full cohort dropped out.

While not shown in Table 2, the percents of dropouts occurring between school years and during school were compared. Over the summer of 1980, just after the cohort was established and before the beginning of school in late August 1980, 957 of the 1,609 students dropping out that year failed to show. That is, more dropouts (59.5%) occurred over the summer than occurred during the remainder of the school year. In subsequent years, the percentage of summer "no shows" declined to 46.8, 30.9, and 38.2 percent (for summer 1983) of those

dropping out during a particular school year. During the summer of 1984, after most students had been graduated, the summer rate increased markedly, and almost twice as many dropouts occurred (442 vs. 289) over the summer of 1984 as over the preceding summer. Overall and across the entire follow-up period, 49.6% of the dropouts took place between the end of one and the beginning of the next school year.

Consider next Table 3 on the following page. This table shows the annual and total rates for males and for females. In reviewing the Table 3 data it will be noted that there are four rates for each sex group. These rates each answer a different question and are changed simply by using a different number in the denominator of the ratio. Side headings are intended to make the various rates clearly distinguishable.

As indicated in Table 3, of the 5,563 dropouts, 55.9% were male and 44.1% were female (row 4). Thus, while males compose a slightly larger proportion of the cohort than females (51.3% vs. 48.7%), they compose an even larger proportion of the dropouts (55.9% vs. 44.1%). And, as earlier noted, the proportion of males dropping out (row 3 - 32.1%) is larger than that for females (row 3 - 26.8%).

These annual patterns follow closely that of the total cohort displayed in Table 2. More males and females dropout in the first two years than in the last two-and-one-half years of the follow-up. While the proportion of dropout occurring each year (row 2) is reasonably consistent for the two cohorts there is one slight variation. Slightly more male dropouts occur during the first two years and last half year, while slightly more of the female dropouts occur during the third and fourth year - the years at which most students in the cohort would be eleventh and twelfth graders.

Consider next the annual rates for the four ethnic groups. These rates are displayed in Table 4 on page 7.

As noted earlier, the overall dropout rate is lowest for Asians (19.0%), then Whites (26.4%), followed by Hispanics (29.3%), and then Blacks (33.9%) - see row 2.

The annual patterns for the three large ethnic groups show some comparatively strong variations. For White students, more than one-third of the dropouts (row 2) occurred in the first year (and most of these over the summer of 1980). It is believed, but cannot be proven, that this large number/percent was in part a response to large Cuban/Haitian influx that occurred during this period. The higher rate for Hispanic students (row 2) in 1981-82 may also be, in part, a more delayed response to this influx; but again the interpretation is speculative and cannot be proven. Note, that for both White and Hispanic students the year after the high rate shows a large drop in the rate, from 34.9% to 26.1% for White students and from 30.2% to 19.6% for Hispanic students.

For Black students the percent of dropouts occurring each year shows a still different pattern. In general, this pattern is less variable across the years than is that for White or Hispanic students. A smaller percentage (row ?) of Black dropouts occur during the first two years and a higher percentage occurs in the last year-and-a-half. Thus, when compared to White and Hispanics dropouts, Blacks who dropout are more likely to do so late in the follow-up period and are somewhat less likely to dropout early in the period.

Table 3*

Numbers and Percents of Male and of Female Dropouts
Leaving Each Year of the Follow-up Period

MALE	1980-81	1981-82	1982-83	1983-84	1985	TOTAL
1) No. of Male dropouts	907	876	598	417	309	3,107
2) % of 3,107 Male dropouts	29.2	28.2	19.2	13.4	9.9	100%
3) % of 9,667 Male cohort	9.4	9.1	6.2	4.3	3.2	32.1%
4) % of 5,563 dropouts	16.3	15.7	10.7	7.5	5.6	55.9%
5) % of 18,829 cohort	4.8	4.7	3.2	2.2	1.6	16.5%
FEMALE						
1) No. of Female dropouts	702	672	528	341	213	2,456
2) % of 2,456 Female dropouts	28.6	27.4	21.5	13.9	8.7	100%
3) % of 9,162 Female cohort	7.7	7.3	5.8	3.7	2.3	26.8%
4) % of 5,563 dropouts	12.6	12.1	9.5	6.1	3.8	44.1%
5) % of 18,829 cohort	3.7	3.6	2.8	1.8	1.1	13.0%

*"1)" denotes the number of M/F dropouts; "2)" shows this number as a percent of the total number of M/F dropping out; "3)" shows this number as a percent of the M/F membership; "4)" shows this number as a % of the total (5,563) dropouts; "5)" shows this number as a percent of the total (18,829) cohort. The numbers and percents of male and females in the cohort are respectively, 9667 (51.3%) and 9162 (48.7%).

Table 4*

Numbers and Percents of White, Black, and Hispanic Dropouts During Each of the Four Years and for the First Semester of the Fifth Year

WHITE	1980-81	1981-82	1982-83	1983-84	1985	TOTAL
1) No. of White dropouts	603	452	349	206	120	1,730
2) % of 1,730 White dropouts	34.9	26.1	20.1	11.9	6.9	100%
3) % of 6,559 White cohort	9.2	6.9	5.3	3.1	1.8	26.4%
4) % of 5,563 dropouts	10.8	8.1	6.3	3.7	2.2	31.1%
5) % of 18,829 cohort	3.2	2.4	1.9	1.1	0.6	9.2%
BLACK						
1) No. of Black dropouts	443	487	380	304	199	1,813
2) % of 1,813 Black dropouts	24.4	26.9	21.0	16.8	11.0	100%
3) % of 5,350 Black cohort	8.3	9.1	7.1	5.7	3.7	33.9%
4) % of 5,563 dropouts	8.0	8.8	6.8	5.5	3.6	32.6%
5) % of 18,829 cohort	2.4	2.6	2.0	1.6	1.1	9.6%
HISPANIC						
1) No. of Hispanic dropouts	552	601	391	247	201	1,992
2) % of 1,992 Hispanic dropouts	27.7	30.2	19.6	12.4	10.1	100%
3) % of 6,792 Hispanic cohort	8.1	8.8	5.8	3.6	3.0	29.3%
4) % of 5,563 dropouts	9.9	10.8	7.0	4.4	3.6	35.8%
5) % of 18,829 cohort	2.9	3.2	2.1	1.3	1.1	10.6%
ASIAN/PACIFIC** ISLANDERS						
1) No. of As/PI dropouts	-	-	-	-	-	23
2) % of 23 As/PI dropouts	-	-	-	-	-	100%
3) % of 121 As/PI cohort	-	-	-	-	-	19.0%
4) % of 5,563 dropouts	-	-	-	-	-	0.4%
5) % of 18,829 cohort	-	-	-	-	-	0.0%

*The row designations in this table are analogous to those in Table 3. Some numbers and percents will not total to those used in Table 1 because "American Indian" is also used as an ethnic designation but, because of its small membership, rates are not displayed in this table. Of the total cohort (18,829), 34.8% were White, 28.4% were Black, 36.1% were Hispanic, and 0.6% were Asian/Pacific Islanders (As/PI).

**Because of their small numbers, only overall rates are shown for the 121 Asian/Pacific Islanders.

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In addition to the information on the four ethnic groups discussed above, the dropout rates for Cuban and Haitian students are also of interest and are next considered.

For current purposes, "Cuban" or "Haitian" means place of birth. In terms of the earlier ethnic designations, Cubans are part of the Hispanic cohort and Haitians part of the Black cohort.

Consider first the rates for Cuban-born Hispanics, i.e., those 1980, eighth-grade Hispanic students whose records list Cuba as the place of birth. These students compose 3,041 (44.8%) of the 6,792 students identified as Hispanic. Pertinent data for these students are shown in Table 5 below; note that the students are subdivided into three groups based on the time-period in which they first entered DCPS.

Table 5

Numbers of Cuban-born, 1980 Eighth Grade Students and Percent Dropping Out, By DCPS Entry Period

	Entry Period	No. of Students	No. Dropping Out	Percent Dropping Out
1)	Prior to 1976	2,216	646	29.2%
2)	Between 1976-78	294	92	31.3%
3)	Between 1979 and June 1980	531	175	33.0%
4)	TOTAL	3,041	913	30.0%

Perhaps the most striking feature of these data is the overall dropout rate (row 4) of 30.0%. This rate is only slightly higher than that (30.0 vs. 29.3%) for the entire Hispanic cohort of 6,792 students. When rates (not shown in Table 5) are compared for the Cuban-born vs. the other 3,751 Hispanic students, the difference is only slightly larger (30.0% vs. 28.8%). When the Cuban-born rates are considered by period of entry to DCPS, the rates are slightly higher for the more recent enrollees. Overall, the dropout rates for those Cuban-born students enrolling in DCPS around the time of the "Mariel boat lift" (or during the previous year) have about the same overall dropout rate as Black students (33.0% vs. 33.9%). Cuban-born students having enrolled in the district before 1976 have an overall rate that is all but indistinguishable from that for other Hispanic students (29.2 vs. 28.8). Thus, the language and cultural shock problems that might be thought to affect the immigrating students do not appear to be associated with substantially higher dropout rates.

Consider next the dropout rates for Haitian students. Of the 5,350 Black students in the 1980, eighth grade cohort, 85 are identified as Haitian. Across the four-and-one-half years of the follow-up, 33 (38.8%) dropped out. This rate is higher than that for any other ethnic group considered in this report. It is, however, only five to six percentage points higher than that for all Black students (38.8% vs. 33.9%). As was the case with the Cuban-born students, the potential language and cultural shock problems that these students may have encountered appear to be associated with a dropout rate differential of four to six percentage points.

Next, consider the dropout rates for exceptional (but not gifted) students. Appropriate data for exceptional students and students by ethnicity are shown in Table 6.

Table 6

Exceptional Student Dropout Rates, Also by Ethnicity

	White	Black	Hispanic	Asian*	All Exc. Students
1) No. of Students	441	498	404	4	1,351
2) No. of Dropouts	167	220	153	1	541
3) % of Dropouts	37.9	44.2	37.5	25	40.0%

As is obvious from Table 6, exceptional students dropout rates are higher than those for "regular" students, and this pattern holds with reasonable accuracy for the individual ethnic groups as well. Rates, not shown, were calculated from the ethnic groups with exceptional students removed. In every case, those rates for "regular" students were from 0.5 to 0.9 percentage points lower than the comparable rate for the total ethnic cohort and for the overall cohort. Rather than nearly triple the number of rates already contained in this report (all students, regular students, exceptional students) the decision was made to use the estimating procedures discussed above - and described in the footnote below. Use of these procedures results in rates which are well within the accuracy limits of the basic data.

*To use the rates from Table 2 to estimate the comparable rate for exceptional students, simply increase the Table 2 value by one-third, e.g., a 30% rate be- comes 40%. To estimate the rate for "only regular students," subtract 0.7% from the Table 2 value.

Consider next dropout rates by birth year. These rates are important because they provide an indirect estimation of the relationship between grade retention and dropout rates. The relationship is indirect because the current data do not include retention indices.* However, birth-date data should bear a reasonably close relationship to grade retention.

To conduct this part of the analysis three age groups were constructed: students born before 1965, during 1965, and those born after 1965. Generally, 1980 eighth graders born after 1965 have progressed through school at the typical pace. Those students born in 1965 have probably been retained at one grade, but some may be late entry students, exceptional students, or emigres who were placed back one or more years because of both poor English language facility and weak educational programming. Students born before 1965 have almost certainly been retained at least once and perhaps more.

Below, in Table 7, data for the three age groups, by ethnic group, are displayed.

TABLE 7**

Dropout Rates by Birth Date and Ethnic Membership:

1980 Eighth Grade Cohort Followed Four-and-One-Half-Years

	White	Black	Hispanic	Total
Born before 1965				
No. of Students	325	592	848	1,779
No. of Dropouts	187	386	404	980
% of Dropouts	57.5	65.2	47.6	55.1%
Born in 1965				
No. of Students	1,216	1,669	2,279	5,200
No. of Dropouts	483	813	797	2,104
% of Dropouts	39.7	48.7	35.0	40.4%
Born after 1965				
No. of Students	5,018	3,089	3,665	11,850
No. of Dropouts	1,050	614	791	2,479
% of Dropouts	21.1	19.9	21.6	20.9%

*To calculate the actual number of times a student had been retained would have required programming and file matching well beyond the scope and time allocated to the current study.

**The "Total" includes Asian/Pacific Islanders and American Indians.

As indicated by the data in Table 7, birth year has a strong relationship with dropout rate. More than half of the cohort dropouts (55.4%, or 3,084 of the 5,563) have probably been retained one or more years by June 1980. Moreover, and even for this group, students most likely to have been retained two or more times (born before 1965) have a dropout rate almost fifteen percentage points (55.1% vs. 40.4%) higher than those probably retained only one year (born in 1965). Further, students born after 1965 (who have progressed at the usual, one-year-one-grade pace) have an overall dropout rate of about half of that characteristic of students born one year earlier.*

Note, however, that despite the strong relationship between birth date and dropping out, nearly half of the students who ultimately dropped out had progressed "normally" to the eighth grade. Secondly, some six percent (1,135 students) of the cohort had not been graduated by the end of the 1983-84 school year, but were still in school as of February 1985; they had been retained at least once after grade eight and had not dropped out.

Consider next the dropout-birth-year relationships for the three ethnic groups. Three features of the data stand out. The first has to do with the percentage of each ethnic cohort being one or more years out of age-grade phase, that is, being in the eighth grade in 1980 and having been born during or before 1965. Slightly over one-third (37.0%) of the total cohort is out of phase by one year or more. However, the percentages for the three ethnic cohorts differ considerably; 25.5% of the White, 42.3% of the Black, and 46.0% of the Hispanic students who were eighth graders in 1980, were born during or before 1965.

Secondly, the dropout rate for the out-of-phase students in the total cohort is 43.0%. However, by ethnic cohort, the rate for Blacks is highest at 53.0%, and is lowest for Hispanics at 38.4%, the White dropout rate being 43.5%.

The third feature of the data is perhaps the most striking. The dropout rates for those students who were not out of phase, is almost identical for the three ethnic cohorts. Quite simply, students who are not out of phase by grade eight are equally likely to drop out regardless of ethnic membership, and are less than half as likely to drop out as students who are out of phase by that time.

*The reader should not conclude that retention per se causes higher dropout rates. More likely is the occurrence that low achievement causes both being retained and dropping out. Even more likely is the occurrence that low interest in school, little extra school support for school accomplishment, and a host of other factors cause low achievement which ultimately causes "dropping out."

APPENDIX

There are two generally accepted approaches to calculating dropout rates. These approaches will produce different, but equally accurate, rates because calculations of the rates are made on different bases. One method, currently required by state law, may be called the one-year, cross-sectional method; the other may be called the multi-year, longitudinal method.

In the cross-sectional method, the number of students (16 years or older) within a given school year is calculated and of this set the number dropping out is also calculated. The dropout rate is the latter count divided by the former, expressed as a percentage. This rate essentially states, "of all students in membership in a given year, xx percent dropped out." This is the type of rate historically reported by the district.

The longitudinal method approaches the rate calculations quite differently and with different intents. In this method, all students of appropriate age or grade at a specific point in time (e.g., 7/1/80) are identified and followed for a predetermined number of years. The percent having dropped out at the end of that period (and perhaps at yearly intervals within the period) is calculated. The calculation is the number dropping out divided by the number identified originally, expressed as a percent. In this method, the original group, called the "initial cohort," is never modified, i.e., students are not added to or subtracted from the initial cohort.

The intent of the longitudinal procedure is to take a precisely defined group and make accurate statements about its status at the end of a meaningful period(s) of time. This intent is, of course, quite different from that of the cross-sectional method. And this difference leads to the advantage and disadvantage of each method.

In the Illustration on the following page, the computations for each of the methods and an example of the differences in their results are provided. The discussion following the Illustration presumes familiarity with all aspects of the example.

ILLUSTRATION

The data below are fictitious; for computational simplicity, they assume a perfectly stable system where the rates are constant overtime and no students enter or leave (except by dropping out) after the beginning of grade 10.

Grade	No. of Students at First of Year	Percentage Dropping Out	No. Dropping Out	No. Going to Next Grade/Graduations
10	1,000	30	300	700
11	700	20	140	560
12	560	10	56	504

A. THE CROSS-SECTIONAL METHOD, GRADE 10-12 STUDENTS FOR ONE YEAR

A.1 Total students in grades 10-12 for one year: beginning - 2,260
end - 1,764

A.2 Number dropping out in grades 10-12 during one year, (2,260 - 1,764) 496

A.3 Dropout rate for grades 10-12 for one year: $(\frac{496}{2,260})$ 21.95%

B. THE LONGITUDINAL METHOD, GRADE 10 STUDENTS FOLLOWED THROUGH GRADE 12.

B.1 Total students at beginning of grade 10 1,000

B.2 Total dropping out by end of grade 12, three years later 496

B.3 Dropout rate from beginning of 10 to end of 12: $(\frac{496}{1,000})$ 49.6%

C. OTHER CONSIDERATIONS

C.1 Both the A3 and B3 dropout rates are accurate, but unequal;

C.2 The A3 and B3 rates are not equal because of a factor analogous to interest compounding. In stable systems, no in- or out-migration, this "compounding" yields a larger denominator for the cross-sectional than for the longitudinal rate calculations. Note in the illustration that the numerators (number of dropouts) are the same (496) in both calculations; the denominators, however, differ (2,260 vs. 1,000). In effect, the denominator of the cross-sectional rate includes all students after grade ten who do not drop out (1,260 in grades 11 and 12). The longitudinal denominator, however, remains the same, including only the 1,000 students from the beginning of grade ten.

C.3 B3, the longitudinal rate, is not three times as large as the annual cross-sectional rate, i.e., $3 \times 21.95 \neq 49.6$; the longitudinal rate is, in this example, slightly over two times larger than the cross-sectional rate;

C.4 Neither A3 or B3 equals the average rate (20%) for the three grades; the A3 rate is the weighted average of the three grade-rates.

In terms of effects, the principal difference between the two procedures is that the annual/cross-sectional method will always produce (except as noted later) lower rates than the multi-year, longitudinal method. This higher rate is due to the compounding in the denominators of those students who at each higher grade do not drop out. Thus, while both rates are correct, they produce different results because they address different problems and use different divisors in the rate calculations.

Each method has its own liabilities and advantages. The principal advantages of the cross-sectional method are:

(1) it is sensitive to year-to-year changes in rates, and can provide rapid feedback on these changes;

(2) it accounts for changes in population membership, i.e., in- and out-migration; and

(3) because it uses a very broad definition of the base student population, it is the only method that can provide accurate rates for all students in membership, irrespective of when they enter the system or how long they stay.

The principal disadvantage of the cross-sectional method is that it cannot provide an accurate longitudinal rate; for example, it cannot accurately represent the percent of students dropping out from the beginning-to-end of a three-year high school program.

The principal advantage of the longitudinal method is that it can provide an accurate answer to the "long-term" questions, given that the initial cohort and follow-up period are precisely and accurately defined.

The principal disadvantages of the longitudinal method are:

(1) the results represent only the initial cohort and cannot reflect those for late entries;

(2) complete, end-of-the-follow-up-period results are available only after the period has expired; and

(3) any errors in the cohort records are compounded and magnified, e.g., labeling as a dropout a student who in fact transferred to another district.

For both methods, the results are meaningfully comparable only to those from other "cohorts" defined the same way and followed for the same period and intervals of time. For example, single year, cross-sectional rates cannot be meaningfully compared to those from a multi-year, longitudinal study; a comparison of the longitudinal dropout rates for high schools with a 10-12 grade configuration with those from schools with a 9-12 configuration is not proper because periods differ for the two sets of schools.

In stable or reasonably stable systems, it is a mathematical fact that the longitudinal dropout rate will always exceed the cross-sectional rate when the two methods cover similar cohorts and grade/year spans, e.g., three years and three grades.* When the cross-sectional rate covers three grades, and the longitudinal rate three years at the same grades, and when the annual cross-sectional rate is around 10-20%, the longitudinal rate will be 1 1/2 to 2 1/2 times higher than the cross-sectional rate.

In unstable systems, it is possible for the cross-sectional rate to exceed the longitudinal rate. But this event is unlikely in that it will occur only when a proportionally large number of students migrate in, after the longitudinal cohort is defined, and then dropout.

Unlike annual, cross-sectional rates, annual rates computed separately for each year of the longitudinal follow-up period may be added, and the sum will equal the total rate across the entire follow-up period.

For longitudinal dropout rates, the longer the follow-up period, the higher will be the overall rate; for example, a three-year period will yield higher dropout rates than a two-year period on the same cohorts. The only time this will not happen is when no one drops out in the third year. It is for this reason that longitudinal rates for a high school with a 9 - 12 grade configuration should not be compared to those for a 10 - 12 school.

When this report is read, it will probably be noted that by-school rates for the four-year period are not included. Such rates were not calculated and this for three reasons. First, and as noted above, the longitudinal rates will differ because of schools' grade configurations. Schools with the wider grade configurations have the students for more years of the follow-up period, i.e., the longer the period, the higher the rate. Secondly, the rates will differ because schools which have students in only the first and/or second year of the follow-up should have higher rates than schools having the students only in the later years of the follow-up. This occurs because the dropout rate is highest in the first two years of the follow-up. (See the results section of this report.)

Third is the problem of "which school should be charged with a student's dropping out." The analysis indicates that a large percent of students drop out between the end of one school year and the beginning of the next. Suppose that the dropping out occurs at the time/grade when the student should matriculate from one school to another, e.g., from a junior to a senior high. In this case, the student completes the junior high but "never shows" at the senior high. To which school should the dropout be allocated for calculation purposes? There is, of course, no equitable answer to this question. In the traditional cross-sectional calculations, this dropout has been attributed to the receiving school. But the longitudinal method, where students are followed across time, quite clearly identifies this as a problem area, and one which cannot be equitably resolved with conventional procedures (methods of identification and of calculation).

*The only exception to this statement is when the dropout rate is 0%, or 100%, or when all dropouts occur at a single year and grade.